

TABLE 2.—Total rainfall, San Antonio and vicinity, September 8-10, inclusive, 1921. (See fig. 1, p. 495, this REVIEW.)

	Inches.		Inches.
No. 1.....	15.00	No. 7.....	13.00
No. 2.....	17.50	No. 8.....	13.18
No. 3.....	20.00	No. 9.....	12.00 to 15.00
No. 4.....	18.00	No. 10.....	8.55
No. 5.....	21.00	No. 11.....	9.50
No. 6.....	15.00	No. 12.....	6.84

There were standard rain-gages at Nos. 7, 8, 10, 11 and 12, and improvised gages at Nos. 1, 2, 3, 4, 5, 6, and 9. The figures for station No. 5 are not considered to be reliable, although there was a standard rain-gage.

The reader is referred for detailed reports of the Texas floods to the articles by Messrs. Bunnemeyer, Jarboe, and McAuliffe, pages 491-497, this REVIEW.

OTHER FLOODS.

There were several rises during the first half of the month in the interior rivers of Indiana and Missouri, but they were inconsequential, although as a whole justifying the warnings that were issued. The value of warnings of minor rises, even though high stages are not expected, is shown by the following extract from a report by Mr. M. W. Hayes, Meteorologist, in charge of the Weather Bureau office at St. Louis, Mo.:

At 7 a. m., September 5, the stage of the Mississippi at St. Louis was 4.8 feet. After the receipt of the 7 a. m. reports from upstream a rise of 6 feet, to occur by noon of the 6th, was forecast. The 5th was a holiday, and every effort was made to give the forecast the widest possible dissemination by telephone, as well as through the afternoon newspapers. The efforts seemed to have been successful, as the river banks were cleared of all property likely to be damaged or destroyed by water, the wharf-boats were pulled in, and engineering work at and below St. Louis was put in a condition to meet the rise. At 12 noon, September 6, the stage was 10.8 feet.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS: SEPTEMBER, 1921.

By J. WARREN SMITH, Meteorologist.

Warm weather for the season was the rule throughout September in all sections of the country, except the far Northwest and parts of the West, and no extensive frost damage was experienced. Freezing temperatures were frequent in the far Northwest, but the cool waves dissipated rapidly in their eastward and southward progress, and freezing weather was confined to the northern Rocky Mountain and northern Plateau districts, the northwestern Great Plains, and in a few localities of the interior of the Northeast. There was some damage by low temperatures in the Northwest, where it was too cool for the proper development of late crops, but the staple crops had largely matured and were not harmed to any great extent.

Farm work was considerably interrupted by rain in the interior Northern States, and during part of the month in some southwestern localities; otherwise the weather was favorable for outdoor operations, and farm work made generally good progress.

Corn matured rapidly with warm weather and considerable sunshine. Most of it was beyond frost danger in Ohio, northern Illinois, Iowa, Missouri, and Nebraska by the middle of the month. Considerable harm was done, however, by molding, sprouting, and rotting in portions of the upper Mississippi Valley by continued wet weather and high temperatures during the latter part of the month, and drying weather was badly needed in all of the central Mississippi Valley States. Late corn

Flood stages during the month of September, 1921.

River.	Station.	Flood stage.	Above flood stages—dates.		Crest.	
			From—	To—	Stage.	Date.
Mississippi drainage, Des Moines West Gulf:	Ottumwa, Iowa.....	Feet. 10	17	18	Feet. 11.4	17
Brazos.....	Valley Junction, Tex.	44	11	13	58.2	12
	Washington, Tex.	45	13	17	50.0	14
	Hempstead, Tex.	40	16	16	40.2	16
	Austin, Tex.	18	10	10	19.0	10
Colorado.....	Columbus, Tex.	28	12	13	33.8	13
	Smithville, Tex.	24	11	11	26.0	11
Guadalupe.....	Gonzales.....	22	11	13	31.4	11
	Victoria, Tex.	16	14	16	20.5	16
Rio Grande.....	Rio Grande City, Tex.	15	10	10	18.0	10

MEAN LAKE LEVELS DURING SEPTEMBER, 1921.

By UNITED STATES LAKE SURVEY.

(Detroit, Mich., October 5, 1921.)

The following data are reported in the "Notice to Mariners" of the above date:

Data.	Lakes. ¹			
	Superior.	Michigan and Huron.	Erie.	Ontario.
Above mean sea level at New York.....	Feet. 602.67	Feet. 580.04	Feet. 572.17	Feet. 245.43
Above or below—				
Mean stage of August, 1921.....	-0.10	-0.14	-0.32	-0.50
Mean stage of September, 1921.....	-0.14	-0.83	-0.22	-0.04
Average stage for September, last 10 years.....	-0.05	-0.68	-0.27	-0.74
Highest recorded September stage.....	-1.41	-3.39	-1.77	-2.18
Lowest recorded September stage.....	+1.18	+0.38	+0.89	+1.43
Average relation of the September level to:				
August level.....		-0.20	-0.20	-0.30
October level.....		+0.20	+0.30	+0.50

¹ Lake St. Clair's level: In September, 574.99 feet.

needed rain in the Southern States, but the harvest of the early crop made good progress.

There was little or no improvement in cotton during the month. The weather was mostly warm and dry, although considerable damage resulted from excessive rains in central and southwestern Texas at the close of the first decade. The continued hot, dry weather was unfavorable in the eastern portions of the belt where plants lost vigor and shed badly in most places. Very little or no top crop was reported from any section of the belt. Cotton bolls opened very rapidly, and picking and ginning made good progress. At the close of the month picking was well advanced in Texas, while the crop had practically all been gathered in the southern half of Georgia, most sections of Florida, and in many localities in southern Alabama. Weevil activity continued marked, with a further spread toward the north-eastern limits of the belt.

The weather was favorable for harvesting late grains, and for thrashing, in the late northwestern districts. During the first half of the month the soil was mostly in good condition for preparation for seeding throughout the principal grain-growing States. Seeding made rather slow progress, however, in the interior valleys the latter part of the month, on account of frequent rains and wet soil, but rapid advance was made in the Great Plains States; this work was begun later than the average in most sections.

Truck crops were unfavorably affected by continued dry weather in the Southeast, especially in Florida, but conditions were more favorable in the central valley States, and truck made good progress on the Pacific coast.

Pastures continued in good condition in most interior States, but there was a lack of moisture in most of the South, while rain was needed in some central Rocky Mountain areas. Range grass cured well in most west-

ern grazing sections and, at the close of the month, stock were being moved from summer ranges in parts of the Rocky Mountain States.

The weather was favorable for drying fruit in California, but the continued dry weather in Florida unfavorably affected citrus fruit in that State where much dropping was reported. Citrus continued in excellent condition in California.

CLIMATOLOGICAL TABLES.*

CONDENSED CLIMATOLOGICAL SUMMARY.

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, September, 1921.

Section.	Temperature.						Precipitation.					
	Section average.	Departure from the normal.	Monthly extremes.				Section average.	Departure from the normal.	Greatest monthly.		Least monthly.	
			Station.	Highest.	Date.	Station.	Lowest.	Date.	Station.	Amount.	Station.	Amount.
Alabama.....	81.2	+6.2	Madison.....	102	5	Valley Head.....	53	30	Tusculumbia.....	6.49	Auburn.....	0.63
Arizona.....	73.7	+0.1	2 stations.....	112	12†	Fort Valley.....	31	19	Soldier Camp.....	5.09	8 stations.....	0.00
Arkansas.....	79.6	+6.0	2 stations.....	104	2†	Gravette.....	35	30	Arkansas City.....	6.96	Huttig.....	0.67
California.....	67.3	-1.2	Greenland Ranch.....	116	13	Fordyce Dam.....	26	15	Nellie.....	4.40	25 stations.....	0.00
Colorado.....	58.3	+1.1	2 stations.....	100	14†	2 stations.....	3	21†	Cheyenne Wells.....	3.81	2 stations.....	0.00
Florida.....	81.6	+2.7	Orlando.....	103	7	Glen St. Mary.....	56	16	Punta Gorda.....	8.20	Okeechobee.....	0.08
Georgia.....	81.2	+6.2	3 stations.....	104	1†	Blue Ridge.....	57	22†	Cornelia.....	6.22	Goat Rock.....	0.29
Hawaii.....	74.3	-0.3	Mahukona.....	94	15	3 stations.....	52	2†	Eke, Maui.....	18.50	6 stations.....	0.00
Idaho.....	53.0	-3.9	Glenns Ferry.....	98	6	Stanley.....	10	12†	Oxford R. S.....	4.52	Arco.....	T.
Illinois.....	71.6	+4.6	Mount Carmel.....	98	16	4 stations.....	40	26	Henry.....	10.07	Mount Carmel.....	3.01
Indiana.....	71.4	+4.7	Wheatfield.....	98	28	4 stations.....	38	25	Veederburg.....	12.20	Mount Vernon.....	1.82
Iowa.....	67.3	+3.9	Mount Pleasant.....	99	4	2 stations.....	31	30	Olin.....	11.95	Lemars.....	1.72
Kansas.....	73.7	+4.6	Salina.....	107	3	2 stations.....	30	30	Paola.....	10.07	Hugoton.....	0.16
Kentucky.....	75.5	+5.5	2 stations.....	99	4	Owensboro.....	45	30	Eubank.....	9.53	Frankfort.....	2.99
Louisiana.....	81.5	+4.2	2 stations.....	102	11†	Calhoun.....	52	30	Covington.....	6.78	Angola.....	0.19
Maryland-Delaware.....	72.6	+5.3	2 stations.....	99	2	Oakland, Md.....	37	26	Friendsville, Md.....	7.63	Salisbury, Md.....	0.26
Michigan.....	64.9	+5.0	Adrain.....	95	1	Deer Park.....	21	16	Port Austin.....	7.50	St. Ignace.....	0.46
Minnesota.....	60.5	+2.8	Beardsley.....	99	1	Itasca State Park.....	27	29	Canby.....	8.32	Meadowlands.....	1.75
Mississippi.....	81.5	+5.9	2 stations.....	103	13	2 stations.....	46	30	Greenville.....	6.66	Bay St. Louis.....	0.53
Missouri.....	73.4	+4.7	Caruthersville.....	104	4†	Steffenville.....	34	30	Avalon.....	14.95	Hollister.....	0.95
Montana.....	51.1	-3.9	Ballantine.....	98	1	Wheaton.....	10	11	Outlook.....	3.91	2 stations.....	0.00
Nebraska.....	66.4	+2.7	2 stations.....	105	3	Nenzel.....	23	30	Nebraska City.....	10.21	Gordon.....	1.60
Nevada.....	61.9	-0.4	Logandale.....	105	4	San Jacinto.....	16	16	Searchlight.....	2.02	8 stations.....	0.00
New England.....	63.1	+3.3	Somerset, Vt.....	96	1†	2 stations.....	25	19†	Waterbury, Conn.....	7.50	Provincetown, Mass.....	0.65
New Jersey.....	70.2	+1.5	Bridgeton.....	99	2†	Charlotteburg.....	36	27	Sussex.....	5.04	Cape May.....	0.80
New Mexico.....	66.1	+1.9	2 stations.....	101	5†	Senorito (near).....	21	21	Portales.....	6.44	11 stations.....	0.00
New York.....	65.5	+4.6	2 stations.....	97	2†	Indian Lake.....	29	27	Townsend.....	5.62	Sharon Springs No. 2.....	0.74
North Carolina.....	76.4	+6.6	Tarboro.....	104	2	Banners Elk.....	46	24	Rock House.....	7.54	Red Springs.....	0.78
North Dakota.....	57.0	+0.6	Hettinger.....	101	1	Hettinger.....	25	30	Pembina.....	6.83	Mott.....	1.37
Ohio.....	70.1	+4.6	2 stations.....	98	1	3 stations.....	38	26	Amesville.....	8.74	Delaware.....	2.03
Oklahoma.....	79.0	+5.0	Oakwood.....	106	4	3 stations.....	32	30	Reno Junction.....	7.83	Goodwell.....	0.00
Oregon.....	56.3	-2.3	Blitzen.....	92	1	Lapine.....	5	13	Cascade Locks.....	5.12	Tule Lake.....	T.
Pennsylvania.....	68.9	+5.1	4 stations.....	98	2	Bradys Bend.....	31	24	Clearfield.....	11.48	George School.....	1.47
South Carolina.....	80.0	+5.8	Florence No. 1.....	104	4	Darlington.....	57	24	Clemson College.....	7.54	Conway.....	0.41
South Dakota.....	61.3	+1.0	Hopewell.....	104	1	4 stations.....	26	11	La Delle.....	10.06	2 stations.....	0.10
Tennessee.....	77.7	+6.6	Clarksville.....	102	5	Kenton.....	50	30	Johnsonville.....	11.31	Clinton.....	1.35
Texas.....	81.1	+4.0	Big Spring.....	107	10	Dalhart.....	35	30	Taylor.....	25.87	2 stations.....	0.00
Utah.....	59.2	-0.8	St. George.....	99	27	2 stations.....	18	17†	New Harmony.....	2.06	8 stations.....	0.00
Virginia.....	74.1	+5.9	Randolph.....	104	2	3 stations.....	46	22†	Fredericksburg.....	5.61	Onley.....	0.55
Washington.....	55.1	-2.9	Wheeler.....	91	27	2 stations.....	19	13	Paradise Inn.....	16.27	Wapato.....	0.00
West Virginia.....	70.9	+5.1	2 stations.....	97	1†	Bayard.....	39	26	Bruceton Mills.....	9.07	Kanawha Falls.....	1.32
Wisconsin.....	63.4	+3.9	Richland Center.....	96	3	Long Lake.....	27	26	Watertown.....	11.02	Merrill.....	2.10
Wyoming.....	54.0	-0.7	3 stations.....	98	2†	South Pass City.....	10	29	Dutch Joe.....	1.44	3 stations.....	0.00

*For description of tables and charts, see REVIEW, January, 1921, p. 41.

†Other dates also.